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Fig. 10. *Cylichna Dekayi* Lea. sp. (var?) Jackson, Miss.

Fig. 11. *Tornatella volutata* n. sp.; Vicksburg, Miss.

Fig. 12. *Ringicula mississippiensis* Conr.; Vicksburg, Miss. "Lower Vicksburgian."

Fig. 13. *Dentalium subcompressum* Mr.; Vicksburg, Miss.

Fig. 13a. The same specimen, view of posterior end.

Fig. 14, 14a. *Unicardium? eocenense* n. sp.; Red Bluff, Miss.

Fig. 15a, 15b. *Tellina eburneopsis?* Conr.; Jackson, Miss.

Fig. 16, 16a, 16a'. *Mikrola mississippiensis* n. gen. et. n. sp.; Red Bluff, Miss.

March 8.

Mr. Charles Morris in the chair.

Fifteen persons present.

The deaths of Jos. Wilson M. D. and Bernard Persh, members, were announced.

March 15.

Mr. John H. Redfield in the chair.

Seventeen persons present.

Papers under the following titles were presented for publication:—

"A List of the Carices of Pennsylvania." By Thomas C. Porter.

"A Prodrome of a Memoir on Animal Locomotion." By Harrison Allen M. D.

On the First and Second Sets of Hair Germs Developed in the Skin of Fœtal Cats.—Prof. Ryder remarked that in a fœtal Kitten, three and one-half inches in length, which he had examined, the germs of certain hair follicles in the skin were more prominent than the great majority of other hair germs. These larger hair germs were especially obvious on the back and on the top of the head, where they formed very slight superficial elevations of the epidermis. Along the middle region of the back and head, these more prominent hair germs formed linear series or rows, which seemed to correspond somewhat in position to the arrangement of the stripes of color on the back of the adults, as seen in the Ocelot and the black and grey-striped variety of the domestic cat or grimalkin. On the sides and on the limbs the linear arrangement of these larger hair germs disappeared entirely, and they were distributed in an irregular manner, pretty uniformly amongst the smaller or less developed hair germs, which were everywhere far more numerous, being very probably the germs of the woolly coat or under-pelt.

It is possible that these larger hair germs represent the rudiments of hairs, which are more particularly sensory in function, and which, like the vibrissæ about the snout, and the groups of tactile hairs above the eyes, and the two groups on the cheeks of many mammals are more richly supplied with sensory nerves than others. The distribution of such tactile hairs in the Mammalia, was also considered by the speaker, who referred to the studies of Eschricht, Stannius and his own, on the distribution of such tactile hairs on the snouts of the fœtuses of various genera of Cetaceans, in which group it had been ascertained that they furnished very good characters diagnostic of species. It was also suggested in support of the view that larger hair germs on the body and head of the fœtal cat, were sensory in function, since they seemed to be arranged in conformity with the color areas on the back, which, as had been pointed out by Prof. Harrison Allen, were the recipients of special branches of the superior twigs of the intercostal rami of the spinal nerves in certain animals, (*Tamias.*) Hairs with a special function have also been found in other regions in the skin of mammals; as for example, certain hairs described by Schöbl on the interdigital wing membranes of bats.

Upon reflection, however, the preceding view of the facts bearing upon the development of two kinds of hair germs in the skin of the fœtal cat, were not wholly satisfactory. It was therefore deemed best to subject the skin of the fœtus in question to still more searching scrutiny. A portion of the skin from the top of the cranium of the fœtus was, therefore, carefully pealed off, stained in borax carmine and cut into sections and mounted as a series. This series of sections revealed several very interesting points, which it was impossible to make out from a more superficial examination.

It was found that the epidermis at this stage was only five or six layers of cells deep, and that there were two very sharply defined types of hair germs growing downwards from it into the corium. The larger and more advanced of these hair germs or follicles were very much thicker and larger than the others, and had penetrated more deeply into the underlying corium, than the less developed ones. At the point where the larger germs joined the epidermis, the latter was thickened so as to form the elevations marking the positions of the larger hair germs, when viewed from the surface. Further study also showed that the rudiment of a hair was well advanced in the larger follicles, while in the smaller ones only the first traces of the hair bulb had been developed, without as yet having given rise to the beginning of a cornified hair shaft. In both kinds of follicles the rudiments of sebaceous glands had been developed from the sides of their necks, though a lumen or cavity had hardly as yet been developed within them. The rete mucosum consisted of of scarcely more than a single layer of rounded cells; of this layer the younger developing follicles are principally composed.

These observations show that there are two distinct types of hair germs developed in the skin of the fœtal cat, one of which is much more advanced in development, and far less numerous, at the same period, than the other. It has also been shown that the larger germs have a certain orderly linear arrangement in some regions, as, for instance, along the dorsal region. The questions which now present themselves in addition to the interpretation already suggested, relate to the nature of these different kinds of hair germs. It seemed to him not improbable, as surmised by Professor Leidy, that the larger germs may be those of the contour hairs, while the smaller ones represent the germs of the finer hairs of the under pelt or woolly coat. Yet this view does not dispose of the question raised by the fact of the orderly arrangement of the larger germs along the back; nor are they numerous enough to be the germs of the contour hairs. It may be that this orderly arrangement relates to an ancestral condition, in which the hairs were fewer and while the ancestral mammalian type was still nearly cold-blooded. This view is supported by the fact that the temperature of the blood of the most reptilian of the mammalia, viz., the Ornithodelphia, is considerably below that of the Didelphia and Monodelphia, and that in at least one of these forms, *Echidna*, the spines, which represent hairs, are arranged in rows. In the other genus, *Ornithorhynchus*, the contour hairs are flat, the under-pelt of wool hairs being very densely set, while the contour hairs are not. Whether the quills or spines of *Echidna* are to be regarded as having descended by development from contour hairs is not known, but it is to be admitted that hairs of that type are most likely to have been developed into quills or spines, since they generally project above the level of the woolly coat and have a much heavier shaft, which is always nearly straight and not crimped. Such an origin may, with much show of probability, be ascribed to the quills of the porcupine.

In a number of mammalian orders, there is a marked tendency toward a dorsal, longitudinal striation, or linear alternation of bands or dots of color, and in a number of cases, this striation is well marked only in the young. This seems to be more than a mere coincidence and probably indicates that in the primitive or ancestral Mammalia, such a pattern was widely prevalent, if not universal. On the sides, on the other hand, there is a tendency toward alternating vertical colors with transverse bars on the limbs. This is a well-marked feature in the tiger, zebra and gnu. Later on it appears that these bars have broken up into dots, giving rise to the dappled or the spotted appearance of such forms as the leopard, giraffe and horse. These features have a very important phylogenetic significance, and point to an ancestral form, in which the color areas were disposed in bands. Looking about, amongst the lower groups, it is in Reptilia alone that we frequently find striping both longitudinal and transverse, and in that it is now admitted by some eminent authorities that the Mammalia are descended from the Reptilia (*Theromorpha*), some explanation is afforded of the prevalent type of color marking in the young of many feral Mammalian forms which are not striped when mature.

The dorsal longitudinal rows of hair germs in the skin of the fœtal cat also afford confirmatory evidence. Their coincidence with the bands of color and precocious development, indicates that they are remnants of a more primitive hairy coat. Their linear arrangement makes it possible to compare them with the linear and longitudinal arrangement of the feathers in birds and of scales in reptiles. In that hairs of mammals, feathers of birds and the corneous scutes of reptiles, are closely related structures and developed from homologous layers of the epidermis in these different classes, it is highly interesting to discover that the set of hair germs, which are the first to develop on the back of the fœtal cat, also show the primordial, linear arrangement of scales and feathers as observed on the backs of reptiles and birds.